

REMARKS/ARGUMENTS

In the Office Action mailed on November 3, 2005, the Examiner objected to Claims 1-12 of this application under 37 CFR 1.75(c), as being of improper dependent form. As a result, the apparatus Claim 1 was treated as an independent claim.

Claims 1-4, 7-9, 11 and 12 were rejected under 35 U.S.C. 102(e) as anticipated by Smithyman (US 6,047,497).

Claims 13, 14, 16-18 and 20 were rejected under 35 U.S.C. 103(a) as unpatentable over Smithyman.

Claims 5, 6, 10, 15 and 19 were rejected as unpatentable over Smithyman in view of Blatchford (Australian Patent Application No. 32801/95).

Rejections under 37 CFR 1.75(c)

Applicant amended Claim 1 to present a method claim. Applicant also amended apparatus claims 2-12 and 16-20 to be presented as method claims. Applicant believes that these amendments should overcome the objection under 37 CFR 1.75 (c). The application now contain one independent Claim 13, and all pending claims are directed to a method.

Applicant appreciates the time and consideration provided by the Examiner in reviewing this application, however, respectfully traverses the rejection of Claims under 35 U.S.C. 102 and 103 for at least the following reasons.

Rejections under 35 U.S.C. 102

Anticipation under 35 U.S.C. 102 requires that each and every claimed feature be disclosed by a single prior art reference.

This rejection was made because the apparatus Claim 1 was treated as an independent claim and rejected under 35 U.S.C. 102(e) in view of Smithyman (US 6,047,497).

Since Claims 1-4, 7-9, 11 and 12 were reconstructed as method claims, and Claim 1 is now dependent upon claim 13, Applicant respectfully requests that the rejection under 35 U.S.C. 102 (e) be withdrawn.

Rejections under 35 U.S.C. 103(a)

Claims 13, 14, 16-18 and 20 were rejected under 35 U.S.C. 103(a) as unpatentable over Smithyman.

According to MPEP 706.02(j):

“To establish a prima facie case of obviousness...the prior art reference (or references when combined) must teach or suggest all claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on the applicant’s disclosure.”

Amendments to clarify the scope of Claim 13 have been made in which a specific order of steps has been identified in the method. Also, the claim has now been more positively confined to a method of fumigating produce in an ISO general purpose shipping container which at least in part defines a fumigation chamber. In making these revisions, care has been taken to ensure that the claims remain supported by the specification and that no new matter has been added. Independent Claim 13 of the present application now defines:

“A method of fumigating produce in an ISO general purpose shipping container which at least in part defines a fumigation chamber, the method comprising the steps of:

- (i) providing a fumigation apparatus including the ISO general purpose shipping container and a mobile fumigation means operatively coupled to the container;
- (ii) locating the produce to be fumigated in the fumigation chamber;
- (iii) providing a flow of a fumigant to the fumigation chamber for a fumigation interval so that fumigation of the produce can occur, and not extracting fumigant from the chamber during the fumigation interval;
- (iv) after the fumigation interval, stopping the flow of fumigant to the chamber;
- (v) after steps (iii) and (iv), extracting the fumigant from the chamber; and
- (vi) absorbing the fumigant extracted from the fumigation chamber.”

The independent claim 13 is a method, which is believed a skilled person would understand to be a “batch” type operation conducted in a shipping container having a fumigation chamber. The fumigant is provided in the fumigation chamber during a fumigation interval and only after the end of the fumigation interval, when the flow of toxic gas into the chamber is stopped, the fumigant is extracted from the chamber and absorbed (see specification, page 9, lines 5-15).

By contrast, the prior art method of Smithyman teaches a *continuous* recycle of the fumigant through the fumigation regions (44a-44c) with a positive teaching toward extraction of the fumigant from the chamber during the fumigation interval. The fumigant gas enters and leaves the fumigation region throughout the fumigation interval. The system of Smithyman *must* operate with continuous recycling of gas through the fumigation region so that it can achieve the promised safety benefits by regulating the amount of the phosphine gas mixed with one or more non-flammable inert gases, such as carbon dioxide and/or nitrogen. The stated problem of prior art phosphine fumigation processes (which Smithyman solved) was that there was “a need for systems capable of managing the flow of such gaseous mixtures during fumigation” (column 2, lines 50-51).

The Examiner states that: “Applicant argues that Smithyman does not teach delaying extraction of the fumigant until after the fumigation interval and that the claimed method does not require continuous recycling. However, as with the claimed method, Smithyman provides for exposure to fumigant during the entire fumigation interval and ceases exposure only after the fumigation interval is complete. Therefore it is not seen how the claimed step is anything other than an obvious alternative since the same effect is achieved.”

Applicant respectfully traverses this statement. To illustrate the inventive differences between the “batch” fumigation method of the instant application as compared with the continuous recycling method of Smithyman, some advantages of the instant method will now be mentioned:

(i) Safety

The fumigants used in the prior art Smithyman and in the instant application are highly dangerous from an occupational health standpoint, and it has been the aim of the present invention to reduce occupational health risks and to prevent environmental discharge of fumigant. This is made clear throughout the present specification (page 1, lines 27-32; page 3, lines 5-9; page 8, lines 9-23; page 9, lines 15-24; page 11, lines 2-3). The method of the present application is deliberately directed and limited to a fumigation chamber within an ISO general purpose shipping container because such shipping containers are generally built to be watertight and gas-tight and have gas-tight end doors (32), which can be sealed (see instant specification, page 8, line 36 - page 9, line 2).

When applied to such shipping containers, the batch-type fumigation method of the instant invention can thus be operated with a high degree of safety because once the flow of fumigant is provided into the fumigation chamber so that fumigation of the produce can occur, the fumigant is *not extracted* from the fumigation chamber during the fumigation interval. In the instant claimed method, no extraction of the fumigant occurs from the fumigation chamber until both the fumigation interval is over and the flow of fumigant into the fumigation chamber has been stopped.

In contrast, in Smithyman, the fumigant is constantly removed from the fumigation chamber. Smithyman passes fumigant from a source 10 into the fumigation region 44 via valve 59, recycle flow line 56, recycling passage 42, valve 62 and branch inlet passage 50. The fumigant can also pass from the source 10 into the fumigation region 44 via supply line 40, region feed line 58, valve 60 and branch inlet passage 50. Once in the fumigation region 44, the gas passes directly into the exhaust passage 48 and via valve 72 back to the blower 54 and the recycling passage 42 back into the branch inlet passage 50. All of the pipework, valves and connections which are used to carry out the method of Smithyman and through which fumigant gases continually flow are located *externally* of the fumigation regions (44a-c). By using such a method over a long term, there is an increased risk of a fumigant gas leak due to failure of a pipe, valve, joint or the like, which could endanger the health of any workers located nearby or allow an atmospheric discharge of fumigant. Moreover, Smithyman teaches a complex method which would require considerable operator training for safe operation. Thus, the method of Smithyman *teaches away* from the present method.

(ii) Operating concentration of fumigant

The batch-type fumigation method of the instant invention can be operated with any desirable concentration of fumigant in the fumigation chamber, which is an advantage in the context of using general purpose shipping containers with a fumigation chamber. In the vicinity of a wharf or port, the type of goods being treated can be quite variable. If a large amount of timber or dunnage is being treated, a batch type fumigation process can be operated using a high concentration of fumigant to achieve an effective fumigation result. In a subsequent treatment when there is less timber etc., a lower concentration of fumigant can be selected for use. The *batch method is thus simple to use*, which is important when the persons who operate the claimed fumigation method typically include trained wharf laborers or technicians.

In contrast, in Smithyman's method, the concentration of fumigant is constantly monitored and managed, largely to prevent ignition of a fire (Smithyman, column 9, lines 58-65). Whereas the system of the instant invention can be operated at any concentration of fumigant, Smithyman simply cannot. The gaseous mixture is usually phosphine gas mixed with one or more non-flammable inert gases, such as carbon dioxide and/or nitrogen (column 4, lines 36-38). The mixture of gases in the Smithyman's system is arranged so that the phosphine gas is not present in high concentrations, which can be highly flammable (column 1, lines 39-57). The stated problem of prior art phosphine fumigation processes which required solving by Smithyman was that there was "a need for systems capable of managing the flow of such gaseous mixtures during fumigation" (column 2, lines 50-51), as well as limiting flammability, etc. (column 2, lines 55-64). The process of Smithyman requires *complex monitoring and control procedures*, and thus, teaches away from the present invention.

(iii) Fumigation interval

In the vicinity of a wharf or port, the persons who operate the claimed fumigation method typically include trained wharf laborers or technicians. The interests of these persons would be served by a rapid turnaround of goods being fumigated. In the instant claimed method, a batch type fumigation process can be operated using a shipping container to quite quickly fumigate materials (specification, page 5, lines 7-18).

In contrast, in Smithyman (column 10, lines 7-14) it is stated that: "Initially the gaseous mixture is diluted when it combines with the atmosphere present in the regions 44a-44c, and the recycling passage 42 before initiation of gas fumigation. *Over time*, more gaseous mixture flows into the recycling passage 42 and the regions 44a-44c, and *eventually*, the concentration of phosphine in the regions 44a-44c increases to a pesticidal level". The process of Smithyman seems to require relatively *long times* for fumigation conditions to be established so that effective fumigation can occur. Thus, the method in the prior art of Smithyman teaches away from the method of the present application.

Summary

The use of a "batch-type" fumigation method, in which specific amounts of fumigant can be added, even to very high levels, allows the method of the instant invention to more quickly and simply achieve an effective fumigation result compared with the prior art method of Smithyman, which teaches away from being able to use a wide range of fumigant concentrations and teaches toward a generally rather slower process, both of which can affect productivity.

Moreover, the instant method offers a higher degree of safety compared with the method taught in the prior art of Smithyman, by not extracting fumigant from the fumigation chamber during the fumigation interval, and by leaving extraction of the fumigant until both the fumigation interval is over and the flow of fumigant into the fumigation chamber has been stopped. Smithyman teaches away from the approach of confining the fumigant to the fumigation chamber as much as possible, and teaches toward a continual flow of fumigant gas into and out of the fumigation chamber. This increases the potential for a gas leak or an occupational health problem to arise.

For these reasons, Applicant submits that the independent Claim 13 is non-obvious and allowable in view of Smithyman, and so are the pending claims dependent on claim 13.

Claims 5, 6, 10, 15 and 19 were rejected as being unpatentable over Smithyman (US 6,047,497) in view of Blatchford (AU 32801/95). On the basis of the attached amended claims and the comments already offered, Applicant respectfully traverses this objection.

Both of the prior art methods taught by Blatchford and of Smithyman involve maintaining a gaseous mixture in constant recycle into and out of a fumigation chamber, rather than the fumigant being confined in the chamber during the fumigation interval, as in the instant invention. In both Blatchford and Smithyman the gaseous mixture is usually phosphine gas mixed with one or more non-flammable inert gases, such as carbon dioxide and/or nitrogen. The mixture of gases in the system of both of these citations is arranged so that the phosphine gas is not present in high concentrations, which can be highly flammable. The 'chamber' 10 in Blatchford is a fumigant generation apparatus for connection to a fumigation region via a circulatory loop gas flow system (page 14, lines 8-10).

There is no teaching or suggestion in the cited prior art documents, alone or in combination, of a method where, after the fumigation interval is concluded, the flow of fumigant is *stopped* and the extraction means initiated to remove the fumigant from the fumigation chamber. As was the case for Smithyman, Blatchford teaches away from being able to use a wide range of fumigant concentrations. Blatchford also teaches away from the approach of the instant claimed invention of confining the fumigant to the fumigation chamber as much as possible, and teaches toward a *continual* flow of fumigant gas into and out of a fumigation chamber. Smithyman and Blatchford have both developed methods that are complex and restrictive to operate.

An ordinary skilled person in the art of fumigation would need some inventiveness to move past the known prior art methods and to develop a new methodology to enable effective fumigation of goods, possibly at very high or unrestricted concentration levels of fumigant in a safe working environment. The prior art methods both teach away from the approach of *confining* the fumigant to the fumigation chamber as much as possible, and, to the contrary, teach a *continual flow* of fumigant gas into and out of the fumigation chamber. The prior art provides no motivation to confine the fumigant in the fumigation chamber using a "batch-type" process. By devising such a process, the inventor and assignee have now found significant commercial success in the quarantine and cargo shipment industries. Applicant respectfully submit that claims 5, 6, 10, 15 and 19 are allowable over the cited prior art, alone and in combination.

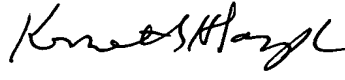
Therefore, it is respectfully submitted that Claim 13 and thus all of the dependent claims as previously presented and amended above now comply with 35 U.S.C. 103, and are allowable in view of the cited prior art.

In view of the above, it is respectfully submitted that the application is now in condition for allowance which is earnestly solicited.

The Commissioner is hereby authorized to charge any additional fees which may be required in this application under 37 C.F.R. §§1.16-1.17 during its entire pendency, or credit any overpayment, to Deposit Account No. 06-1135. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, other-wise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 06-1135.

Respectfully submitted,

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